

Face Recognition with Self Shadows

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Abstract: In the domain of image processing, face recognition has also become a diversified area as per the application. Face recognition in the face of self shadows is one such which is exposed in this work. An Image is usually made up of background and foreground. In most of the cases, the foreground is the area in which the face can be considered as an object of interest. Within this the region of interest is considered to be the area of the face which is covered by the self shadow. The presence of shadows on the face, blocking the light makes the face not visible completely. Due to these reasons, it becomes a problem for face detection and recognition approaches. This system suggested in this work makes sure to detect the face even in the presence of self-shadows when the complete face is not fully visible presenting the entire face.

Keyword:- Face Recognition, Shadow, Shadow Detection, Shadow Removal.

I. INTRODUCTION

Face Recognition has now become of significant importance from researchers in fields like pattern recognition, computer vision, and biometrics from recent years. This process is now being considered as a biometric software that maps the person's facial attributes and assembles that data as a snapshot. This technique has nowadays become very important and useful to properly verify a person's face. Certain computer algorithms have been used to gather different details about the user's face.

These details are very important to be compared with the other faces in the dataset. These details are used to differentiate all the faces in the dataset so as to obtain the correct face in the system. The big advantage of using such a system is that it assures that only authorized users are entered in the system. This maintains security in the system. Face recognition has now become very useful in biometrics and its necessity in maintaining security systems.

Variation in lighting has become the most challenging problems in face recognition systems. A shadow is formed when an opaque object blocks the light from its source. These shadows in computer applications have become a vast problem in the system and can cause a negative effect on the

accuracy and efficiency of the result. To identify the face correctly, maintaining the authenticity and efficiency of the system is necessary.

This work presents a solution in the form of a system which first detects the self shadow, then eliminates it so as to reproduce the face to its maximum accuracy. This paper is organized as follows, the introduction is followed by a literature survey, then the proposed algorithm followed by results and its evaluation.

II. LITERATURE SURVEYS

Literature Survey section has been divided into two sections:-

A. Face Recognition

In face recognition, the system was proposed to perform various operations like face detection, alignment, measurement, representation, matching, and identification.

B. Shadow Detection and Removal

In Shadow Detection and Removal, the papers presented various shadow detection methods and also discussed certain fundamentals of shadows and shadow detection.

III. ALGORITHMS

❖ Proposed Algorithm

Face Recognition has now become very popular as human beings perform face recognition automatically and practically with no effort. Even though it seems to be a very simple task, it is considered to be a complex task for computers.

The two steps required for the same are :-

A. Face Detection

The objective of finding the facial attributes like location and size of an image so that we could extract them to be used by the face recognition algorithm.

B. Face Recognition

The face recognition algorithm is responsible for finding characteristics that properly describes the image.

The algorithm that we are using for face recognition is Local Binary Pattern Histogram. It is an easy and well-organized texture mechanism. It tags the pixels of an image by approaching the neighborhood of each pixel. After doing this it then considers the result as a binary number.

These are the steps that are followed in recognizing the correct face:-

➤ *Step 1:- Various parameters are looked upon like radius, neighbors, etc.*

➤ *Step 2:- Training the Algorithm*

The most important step is to train the algorithm.

➤ *Step 3:- Applying Operations*

The initial step of this is to create a transitional image that is used to describe the original image more appropriately, by highlighting the facial characteristics.

➤ *Step 4:- Performing Face Recognition*

The algorithm is now properly trained. The different images of different users are stored in the dataset each user having a unique ID. Similarly, we have used Canny Edge Algorithm for Shadow Detection and Removal.

IV. EVALUATION AND RESULTS

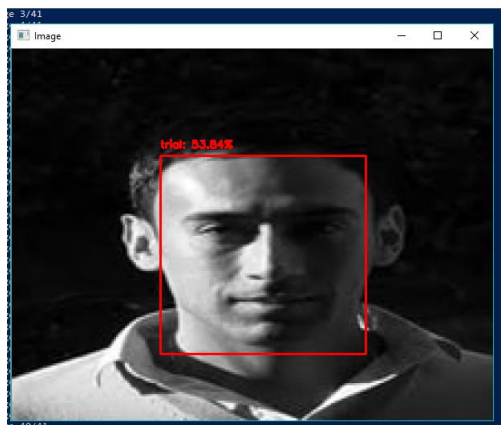


Fig 1

V. CONCLUSION

Face Recognition Technology has come a long way in the recent ways. This paper elaborates upon the approaches of face recognition and detection applications and the issues to overcome. A survey has been performed on various shadow detection and removal techniques. It discusses that the faces could be found efficiently without exhaustively searching for the image. It explains various ways in which this technology is playing a very important role in our daily life and can be enhanced further to ensure more accurate results.

ACKNOWLEDGMENT

We are thankful to all the references below who helped us sharpen our ideas about the topic. We also thank the people who helped us with their constructive criticisms.

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